

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JUNE 1940

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AEROLOGICAL OBSERVATIONS

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The mean surface temperatures during June were above normal over most of the United States. Mean temperatures subnormal for the month occurred over the South Central Region, over Southern New Mexico, the New England States and the extreme North Central Area. Temperatures were highest, relative to the normal for this month, over the area bounded by 110° and 123° W. longitude, and by 37° and 44° N. latitude; nearly all of this area being 6° above normal with an area in western Nevada and eastern California, including the city of Reno, recording mean surface temperatures 8° and 9° above normal.

At the 1,500 m. level direction of the resultant winds at 5 a. m. during June was south of the 5 a. m. normal (counterclockwise) over most of the country south of 40° N. latitude and was north of this normal (clockwise turning) over about half of the area north of this line. Resultant winds south of normal also occurred at this level over the west central and the plateau regions and occurred over the eastern Great Lakes region. At the 3,000 m. level the resultant winds were in general more southerly than normal over the eastern half of the country and were more to the northward than normal over the western half. The same shift in winds was noted at the 5,000 m. level when the 5 p. m. observations were compared to the 5 a. m. normal for that level except that the northward turning of the resultant extended eastward over all the Central and South Central States.

At the 1,500 m. level the resultant velocity of the winds at 5 a. m. during June was above the corresponding normal over the eastern third of the country, with the largest positive departures (3.0 to 3.5 m. p. s.) over the Lake States and over New England, and was also slightly above normal along the northern half of the Pacific coast. The resultant velocity was below normal at this level over the rest of the country. At the 3,000 m. level the resultant velocity at 5 a. m. was above normal over most of the eastern and northern one-third of the country, amounting to 3.8 m. p. s. at Detroit, Mich. At this level resultant velocities were below normal over the Southwest and over the East Central and South Central States. At the 5,000 m. level the 5 p. m. resultant velocities were higher than the corresponding 5 a. m. normals except in the Southwest, where the opposite departures occurred.

The departure of surface temperatures from the normals for the month appears to have been in general accompanied by a corresponding turning in the direction of the resultant wind at levels 1,500 m. and lower. The direction of the resultant wind at levels above 1,500 m. does not appear to directly affect the surface temperatures. It is noted that at the 1,500 m. level the resultant winds are from directions more southerly than the normal over most of the area in which are noted the largest positive departures of the surface temperatures.

At the 1,500 m. level during June the shift in the direction of the resultant wind from 5 a. m. to 5 p. m. was counterclockwise over most of the country. The opposite change occurred over an area along the central and eastern Gulf of Mexico and over a strip including part of the North Central States, the plateau region, New Mexico, and extreme west Texas. At the 3,000 m. level, however, the clockwise shift in resultant direction between 5 a. m. and

5 p. m. extended over most of the country, the opposite wind shift being noted only over the extreme Northeast, over the Northwest and North Central States and over parts of Arizona, New Mexico and Texas.

The changes in resultant velocity from 5 a. m. to 5 p. m. were well divided at the 1,500 m. level, about half of the velocities being higher at 5 p. m. than at 5 a. m. and half lower. Resultant velocities were lower in the late afternoon than in the early morning over the northern and the southern portions of the Pacific coast, over the Central and West Coastal States, over the Great Lakes, over most of the New England area and most of the extreme Southeast. At the 3,000 m. level there was an increase in resultant velocity during the day over about two-thirds of the country, lower velocities occurring at this level only over the extreme Northeast, over a strip along the upper Mississippi Valley, over the extreme Northwest and over portions of Colorado, New Mexico, and Texas.

At all levels above surface, up to at least the 17,000 m. level (table 1), the area of maximum pressure occurred at southern latitudes and the area of minimum pressure at northern latitudes. At the 12,000 m. level, for example, the pressure over Miami was 214 mb., the pressure over Sault Ste. Marie was 201 mb., while still further north in Alaska the pressure at this level was 193 mb. over both Fairbanks and Juneau. At each of the 1,000 m. levels from 8,000 to 15,000 m. inclusive, Miami had the highest pressure shown at any station in the United States, and Sault Ste. Marie the lowest pressure. At the 16,000 m. level San Antonio recorded the highest pressure (112 mb.) and Sault Ste. Marie the lowest (107 mb.), while at the 17,000 m. level the maximum pressure occurred at Pensacola and the minimum over the Great Lakes stations, Sault Ste. Marie and Joliet.

At the 3,000 m. level and above, the mean pressures were higher in June than in May. In some areas this increase in pressure at certain levels was considerable, for example, at the 10,000 m. level the pressures were from 10 to 12 mb. higher in June than in May in the central and east central portions of the country. At levels below 3,000 m. the number of cases in which the June mean pressure was higher than the pressure in May gets larger until at the surface the number of such cases of increases in pressure about equals the number of cases of decreases.

The steepest gradient in mean pressure values occurred across the country from north to south in the eastern one-third of the country. At the 6,000, 7,000, 8,000, and 9,000 m. levels there was a difference of 16 mb. between the pressure at Miami and that at Sault Ste. Marie during June.

At all levels below 12,000 m. the mean free-air temperatures in June over the United States and over the Middle Atlantic Ocean were higher than were the corresponding temperatures in the preceding month. In Alaska, however, while the temperatures at Juneau were higher in June than in May at the 9,000, 10,000, and 11,000 m. levels, the temperature at Fairbanks had increased in the same period at the 9,000 m. level but had decreased at the 10,000 and 11,000 m. levels. The mean free-air temperatures for June were higher than in May over Juneau and over most of the western half of the country at each of the next three higher 1,000 m. levels. At Fairbanks temperatures were lower at these levels. The free-air temperatures over Joliet were colder than in May at these three